

**PATENT APPLICATION**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re application of

Docket No: Q96939

Kunio YAMANE, et al.

Appln. No.: 10/593,633

Group Art Unit: 1796

Confirmation No.: 1928

Examiner: Benjamin GILLESPIE

Filed: September 21, 2006

For: LOW SPECIFIC GRAVITY UNSATURATED POLYESTER RESIN COMPOSITIONS  
FOR LAMP REFLECTORS AND MOLDED ARTICLES THEREOF

**APPEAL BRIEF UNDER 37 C.F.R. § 41.37**

**MAIL STOP APPEAL BRIEF - PATENTS**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. § 41.37, Appellant submits the following:

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I. REAL PARTY IN INTEREST

The real party in interest is Showa Highpolymer Company, Ltd. by virtue of the Assignment submitted and recorded in the present application.

**II. RELATED APPEALS AND INTERFERENCES**

Appellants, Appellants' legal representatives, and the Assignee of this application are not aware of any other appeals or interferences that will directly affect, be affected by, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1 and 3-9 are pending and are rejected.

Claim 2 has been canceled.

Claims 1 and 3-9 are the subject of this appeal.

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**IV. STATUS OF AMENDMENTS**

No Amendment was filed subsequent to the final rejection.

**V. SUMMARY OF THE CLAIMED SUBJECT MATTER**

Claim 1 is the only independent claim on appeal and relates to a low specific gravity unsaturated polyester resin composition for lamp reflectors, characterized in that the composition comprises from 40 to 210 parts by weight of an inorganic filler having an average particle size of at least 0.5 µm, from 30 to 160 parts by weight of a hollow filler having a pressure resistance of at least  $2,100 \times 10^4$  N/m<sup>2</sup> based on 100 parts by weight of an unsaturated polyester resin (See, page 3, lines 16-21 of the specification as filed) and from 35 to 75 parts by weight of a crosslinking agent based on 100 parts by weight of the unsaturated polyester resin and the crosslinking agent (See, page 6, lines 13-17 of the specification as filed), wherein the crosslinking agent comprises: (A) diallylphthalate monomer or diallylphthalate prepolymer, and (B) a crosslinking agent selected from the group consisting of a styrene monomer, methyl methacrylate and triallylisocyanurate (See, page 6, lines 4-6 and 16-19 of the specification as filed). Further, the ratio by weight of the (A) to (B) lies in a range of 5:95 to 25:75 (See, page 6, lines 19-20 of the specification as filed), and the addition ratio by weight of the inorganic filler to the hollow filler lies within a range of 2:8 to 8:2 (See, page 3, lines 22-23, and page 4, lines 23-24 of the specification as filed).

**VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

Claims 1 and 4-9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2004/0085772 to Daichou et al in view of Alger (Polymer Science Dictionary).

Claim 3 stands under 35 U.S.C. § 103(a) as being unpatentable over Daichou in view of Alger and U.S. Patent No. 4,052,358 to Wada et al.

**VII. ARGUMENT**

A. Appellants respectfully submit that present Claims 1 and 4-9 are patentable over Daichou in view of Alger.

Independent Claim 1 of the present application recites:

A low specific gravity unsaturated polyester resin composition for lamp reflectors, characterized in that the composition comprises from 40 to 210 parts by weight of an inorganic filler having an average particle size of at least 0.5 µm, from 30 to 160 parts by weight of a hollow filler having a pressure resistance of at least  $2,100 \times 10^4$  N/m<sup>2</sup> based on 100 parts by weight of an unsaturated polyester resin and from 35 to 75 parts by weight of a crosslinking agent based on 100 parts by weight of the unsaturated polyester resin and the crosslinking agent, said crosslinking agent comprising:

- (A) diallylphthalate monomer or diallylphthalate prepolymer, and
- (B) a crosslinking agent selected from the group consisting of a styrene monomer, methyl methacrylate and triallylisocyanurate;

wherein the ratio by weight of the (A) to (B) lies in a range of 5:95 to 25:75, and

wherein the addition ratio by weight of the inorganic filler to the hollow filler lies within a range of 2:8 to 8:2.

More particularly, the presently claimed low specific gravity unsaturated polyester resin composition is characterized by using two crosslinking agents (that is, ingredients (A) and (B)) having a specific weight ratio. According to this constitution, the coating property of paints on a molded article obtained by the presently claimed resin composition is improved. See, paragraph [0022] of the present specification.

With regard to the present claims, though acknowledging that Daichou fails to disclose or suggest the specific ratio of (i) styrene and (ii) diallylphthalate, as recited in present Claim 1, the Examiner takes the position in the Advisory Action dated March 5, 2010, that “this does not mean it would be unobvious to arrive at the present claim limitations.” In support of his position, the Examiner asserts that one of basic knowledge of polymer science would understand that as the degree of branching in a cured polymer increases - i.e. as the amount of (ii) in the curing agent increases relative to (i), the cured polymer will exhibit less thermoplasticity and resemble more of a thermoset polymer, which are known to exhibit better heat resistance. Further, Appellants note that in the Advisory Action dated March 5, 2010, the Examiner refers to heat resistance as a coating property.

The Examiner’s position is in error and fails to establish a *prima facie* case of obviousness.

According to the present invention, the presently claimed low specific gravity unsaturated polyester resin composition is characterized by using two crosslinking agents (that is, ingredients (A) and (B)) having a specific weight ratio, wherein the amount and weight ratio of the two crosslinking agents influence not only the heat resistance of the cured product but also the coating property of the cured product.

Daichou and Alger fail to disclose or suggest the above feature of the present Claim 1. In particular, the Polymer Science Dictionary states that the monomer (such as diallylphthalate) is used to replace styrene in the crosslinking of unsaturated polyester resin to give products with greater heat resistance (the monomer is not disclosed as being used in combination with styrene). Thus, even if a person of ordinary skill in the art were to use a diallylphthalate polymer, it would be used in place of styrene, not in combination with styrene (or one of the other (B) crosslinking agents), as presently claimed.

In addition, Daichou and Alger fail to recognize the relationship between the use of the two crosslinking agents having a specific weight ratio and the effect (improved coating properties) arising therefrom. Thus, a person of ordinary skill in the art would not conceive of using two crosslinking agents having specific weight ratio, in order to improve coating properties of the composition, as presently claimed.

In this regard, Appellants submit that there is no predictable relationship between the heat resistance of a cured product and the coating property of paints on the cured product. As demonstrated by Comparative Examples 10 and 15 of the present specification, even if a cured product has a high coating property, the cured product may simultaneously have a low heat

resistance. Accordingly, the coating property of the presently claimed cured product is distinct from the heat resistance of the cured product, and as such, the improvement of one property does not result in an improvement of the other property.

In addition, the Examiner asserts that “only a single ratio of (i):(ii) is disclosed in Applicants’ examples.” Thus, the Examiner concludes that “[t]here is no way to determine if Applicants’ alleged unexpected result would also be obtained when using every ratio of (i):(ii) allowed by Claim 1.”

The Examiner misunderstands the examples in the present specification.

As shown in Tables 2-4, Appellants disclose Working Examples wherein components (A) and (B) are utilized a wide variety of ratios. Thus, Appellants submit that the Working Examples in the present specification are commensurate in scope with the breadth of the present claims, and demonstrate unexpected results across the presently claimed ratio range.

For the foregoing reasons, it is respectfully submitted that Claims 1 and 4-9 are patentable over Daichou and Alger. Accordingly, Appellants respectfully request reversal of the §103 rejection.

**B. Appellants respectfully submit that Claim 3 is patentable over Daichou in view of Alger and Wada.**

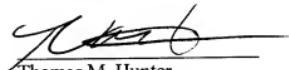
Claim 3 is patentable at least by virtue of its dependence from Claim 1, and for the reasons discussed above, particularly since Wada does not make up for the deficiencies of Daichou and Alger as discussed above, and since the present invention has unexpectedly superior results. Accordingly, Appellants respectfully request reversal of the §103 rejection.

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The USPTO is directed and authorized to charge the statutory fee (37 C.F.R. §41.37(a) and 1.17(c)) and all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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**23373**  
CUSTOMER NUMBER

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**CLAIMS APPENDIX**

**CLAIMS ON APPEAL:**

1. A low specific gravity unsaturated polyester resin composition for lamp reflectors, characterized in that the composition comprises from 40 to 210 parts by weight of an inorganic filler having an average particle size of at least 0.5  $\mu\text{m}$ , from 30 to 160 parts by weight of a hollow filler having a pressure resistance of at least  $2,100 \times 10^4 \text{ N/m}^2$  based on 100 parts by weight of an unsaturated polyester resin and from 35 to 75 parts by weight of a crosslinking agent based on 100 parts by weight of the unsaturated polyester resin and the crosslinking agent, said crosslinking agent comprising:

(A) diallylphthalate monomer or diallylphthalate prepolymer, and

(B) a crosslinking agent selected from the group consisting of a styrene monomer, methyl methacrylate and triallylisocyanurate;

wherein the ratio by weight of the (A) to (B) lies in a range of 5:95 to 25:75, and

wherein the addition ratio by weight of the inorganic filler to the hollow filler lies within a range of 2:8 to 8:2.

3. A low specific gravity unsaturated polyester resin composition for lamp reflectors according to Claim 1, characterized in that said polyester resin is obtained by polycondensing a total of 100 moles consisting of 20 to 50 moles of propylene glycol, 25 to 65 moles of neopentyl glycol and 15 to 25 moles of bisphenol A or hydrogenated bisphenol A based on 100 moles of at

least one unsaturated polybasic acid selected from a group formed from fumaric acid and maleic anhydride.

4. A low specific gravity unsaturated polyester resin composition for lamp reflectors according to Claim 1, characterized in that the inorganic filler has an average particle size of 15 $\mu$ m or less.

5. A low specific gravity unsaturated polyester resin composition for lamp reflectors according to Claim 1, characterized in that the hollow filler has a true specific gravity of 0.3 to 0.7.

6. A low specific gravity unsaturated polyester resin composition for lamp reflectors according to Claim 1, characterized in that molded articles of the resin composition have a molding shrinkage ratio of -0.15 to +0.05%, a coefficient of linear expansion of  $1.0 \times 10^{-5}/K$  to  $2.5 \times 10^{-5}/K$ , Barcol hardness of 5 to 25 when heated at 180°C and a specific gravity of 1.00 to 1.60.

7. A low specific gravity unsaturated polyester resin composition for lamp reflectors according to Claim 1, characterized in that the molded articles of the resin composition have a leveling of 5 to 20.

8. A molded article obtained by molding the low specific gravity unsaturated polyester resin composition for lamp reflectors according to Claim 1.

9. A molded article according to Claim 8, characterized in that the molded article has a molding shrinkage ratio of -0.15 to +0.05%, a coefficient of linear expansion of  $1.0 \times 10^{-5}/K$  to  $2.5 \times 10^{-5}/K$ , Barcol hardness of 5 to 25 when heated at 180°C and a specific gravity of 1.00 to 1.60.

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**EVIDENCE APPENDIX**

None.

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**RELATED PROCEEDINGS APPENDIX**

None.